



Mandown Option Board

ENLN4150A

Study Guide

for

**Motorola Professional Portable
Radios**

68P64121B10

Computer Software Copyrights

The Motorola products described in this manual may include copyrighted Motorola computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Motorola certain exclusive rights for copyrighted computer programs, including the exclusive right to copy or reproduce in any form, the copyrighted computer program. Accordingly, any copyrighted Motorola computer programs contained in the Motorola products described in this manual may not be copied or reproduced in any manner without the express written permission of Motorola. Furthermore, the purchase of Motorola products shall not be deemed to grant, either directly or by implication, estoppel or otherwise, any license under the copyrights, patents or patent applications of Motorola, except for the normal non-exclusive royalty-free license to use that arises by operation of law in the sale of a product.

Table of Contents

Chapter 1 PRODUCT OVERVIEW

1.0	Introduction	1-1
1.1	Market Requirements	1-1
1.2	Compatibility	1-1
2.0	Functionality	1-2
2.1	Man Down Alarm Functionality	1-2
2.2	Anti-movement Alarm Functionality	1-3
2.3	Movement Alarm Functionality	1-3
3.0	Timers and Alert Tones	1-4
3.1	Alert tones	1-4
3.2	Pre-Alert and Alert times	1-4
3.3	Sensor Sensitivity	1-4
3.4	Settle Down Time	1-4

Chapter 2 SERVICE SOFTWARE OSS

1.0	Introduction	2-1
1.1	General Functions	2-1
2.0	Programmable Functions	2-1
2.1	Mandown	2-1
2.2	Anti-Movement	2-1
2.3	Movement	2-1
3.0	OSS Programming Guide	2-2
3.1	Reading the Option Board	2-2
3.2	Edit the Option Board	2-2
3.3	Setting the Mandown Status	2-3
3.4	Setting the Anti-Movement Status	2-3
3.5	Setting the Movement Status	2-4
3.6	Programming the Option Board	2-4
4.0	Installation of the Option Board into a Portable Radio	2-4

Chapter 3 APPLICATION NOTES AND SPECIFICATIONS

1.0	Introduction	3-1
1.1	5-Tone Radios	3-1
1.2	MPT Radios	3-1
1.3	MDC/Conventional Radios	3-2
2.0	Self-Quieting Frequency List	3-3
3.0	Environmental Specification	3-4
4.0	Tolerances	3-4

Chapter 1

PRODUCT OVERVIEW

1.0 Introduction

The Motorola Mandown Option Board is a plug-in board for the Motorola Professional Radios.

It triggers an emergency procedure in situations where the radio is horizontal or still for longer than a pre-programmed time.

It has been developed for a variety of situations and in particular where radio users work alone or in isolated environments.

The sensor is environment friendly and 100% mercury free

1.1 Market Requirements

The Man Down Option Board has been developed for a variety of situations and in particular where radio users work alone or in isolated environments.

For instance: security guards operating in business buildings, forestry workers, agricultural workers and utility maintainers on industrial plants.

Within an organisation, fitting the option board inside the radios provides improved commitment to staff safety and security, as an alarm will automatically be sent out when the user comes in an emergency situation.

1.2 Compatibility

The Mandown Option Board is compatible with all 5-Tone, MPT and MDC/Conv portable radios of the Professional Radio Series in all bands (except P040/P080 and GP320).

It is also operational with all connected original Motorola accessories for the GP Professional Radios Series portables.

Installation in any Intrinsically Safe (IS) radios will invalidate the radio's IS approval (i.e. FM-radios).

2.0 Functionality

There are 3 modes the board can be programmed for:

- ☐ Man Down alarm
- ☐ Anti-movement alarm
- ☐ Movement alarm

2.1 Man Down Alarm Functionality

This functionality monitors the duration of time the radio is horizontal.

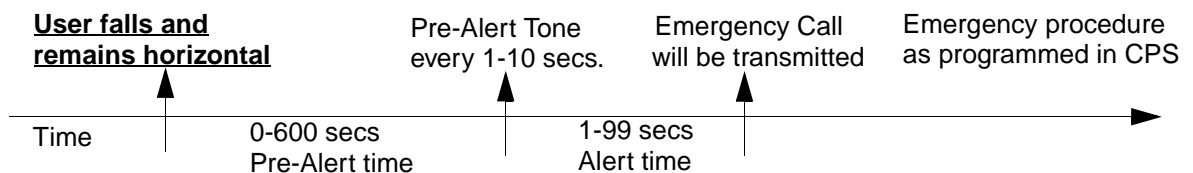
It can be used in conjunction with the Anti-Movement Alarm but not with the Movement Alarm functionality.

An emergency call is generated when the radio is horizontal for longer than a pre-programmed time.

Before the emergency call is sent, the user will be prompted by an alert tone to bring the radio in a more vertical position, thus restarting the time counter.

The time duration between the alert tone and the generation of the emergency call is pre-programmable.

The horizontal position can be detected within activation angle range in three steps: 30, 45, and 60 above or below the horizontal position.

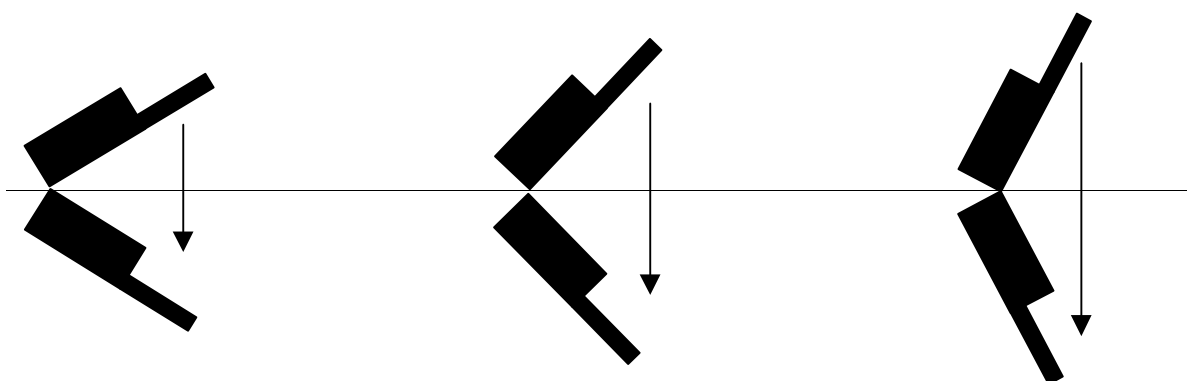


Possible activation angles measured from the horizontal:

+/- 30°

+/- 45°

+/- 60°



2.2 Anti-movement Alarm Functionality

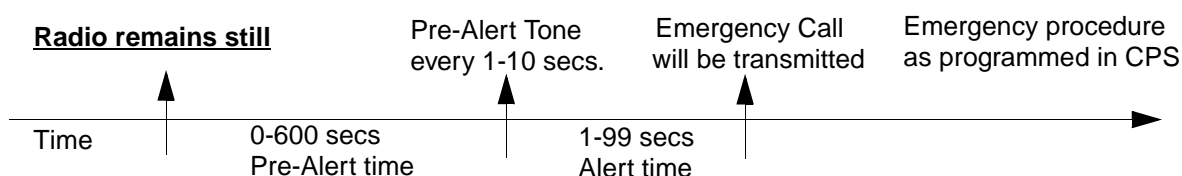
This functionality monitors the duration of time the radio is still.

It can be used in conjunction or separately from the Man Down alarm functionality but not with the Movement Alarm.

An emergency call is generated if the radio is still for longer than a pre-programmed time.

Before the emergency call is sent, the user is prompted by an alert tone to move the radio, thus restarting the time counter.

This timer is therefore separate from the Man Down alarm timer.



2.3 Movement Alarm Functionality

This functionality monitors any movement of the radio.

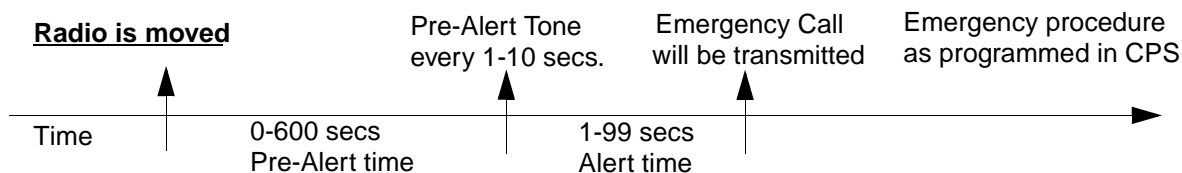
It cannot be used in conjunction with the ManDown and anti-movement alarm functionality.

An emergency call is generated if the radio is moved.

This functionality mode is preceded by a pre-programmable count down time. It is separate from the ManDown and Anti-Movement timer.

Before the emergency call is sent, the user can be prompted by an alert tone to stop the function, by turning off the radio or disabling the option board (via radio firmware).

The time duration between the alert tone and the emergency call is pre-programmable. This function can also be enabled or disabled (no alert tone) via the Option Board Service Software (OSS).



3.0 Timers and Alert Tones

3.1 Alert tones

2 different alert tones are needed, one for the Mandown and Anti-movement functions and another one for the Movement function.

The Repeat function is also available via the OSS and programmable from 1 to 10 seconds.

The Alert Tone for the Movement function uses the same tones but with a different pattern.

The total duration of sequences is one-second minimum.

3.2 Pre-Alert and Alert times

3.2.1 Pre Alert Time

This is the period between the detection of the event (ManDown, Anti-Movement, or Movement) and the generation of the Alert Tone.

A range from 0 to 600 seconds can be programmed for ManDown and Anti-Movement

A range from 0 to 99 seconds can be programmed for Movement

3.2.2 Alert Time

This is the period between the Alert Tone and the generation of an emergency call.

A range from 1 to 99 seconds can be programmed

3.3 Sensor Sensitivity

The sensor sensitivity is adjustable in three steps:

- ☐ Minimum
- ☐ Medium
- ☐ Maximum

3.4 Settle Down Time

After turning the radio ON the sensor at the Mandown board needs a settle down time of approx. 15 sec. before all the timers will start to count exactly.

Chapter 2

SERVICE SOFTWARE OSS

1.0 Introduction

This chapter describes Mandown Option Board Service Software (OSS).
The OSS is downloadable for dealers within Europe, Middle East and Africa from "Motorola Online"

Resource Centre/Product and Technical Information/Radio Service Software

1.1 General Functions

- ☐ Read and Write from/to the Board.
- ☐ Open and Save from/to disk.
- ☐ Repeat times of Emergency Trigger by the board: once or every 1-99 sec.
- ☐ Sensor Sensitivity: at least 3 steps (e.g. Min./Med./Max.).
- ☐ Help texts selectable in English, German, Spanish, French and Russian.
- ☐ Selection of COM-Port for Programming Cable to the radio.
- ☐ OSS is operational under Windows 95/98/2000/NT.

2.0 Programmable Functions

2.1 Mandown

Period before Mandown Pre-Alertton: from 0-600 sec.

Period between Mandown Pre-Alertton and Emergency Trigger: from 1-99 sec.

Mandown Sensor Activation Angle in 3 steps e.g. 30°/45°/60°

2.2 Anti-Movement

Period before Anti-Movement Pre-Alertton: from 0-600 sec.

Period between Anti-Movement Pre-Alertton and Emergency Trigger: from 1-99sec.

2.3 Movement

Period before Movement Pre-Alertton: from 0-99 sec.

Period before Movement Sensor activates Emergency Trigger from: 1-99 sec.

Enable/Disable Movement Pre-Alertton

3.0 OSS Programming Guide

(For information on the operating parameters of the Man Down Option Board, please refer also to the "Help" file for the ManDownOSS program which is available in English, German, French, Spanish and Russian)

3.1 Reading the Option Board

1. Locate the "ManDownOSS.exe" program for the option board and double click on the file-name to start the program.
2. Read the option board by clicking on the "Read" icon (refer to Figure 2.1) or clicking on "Read Option Board" from the "File" dropdown menu.

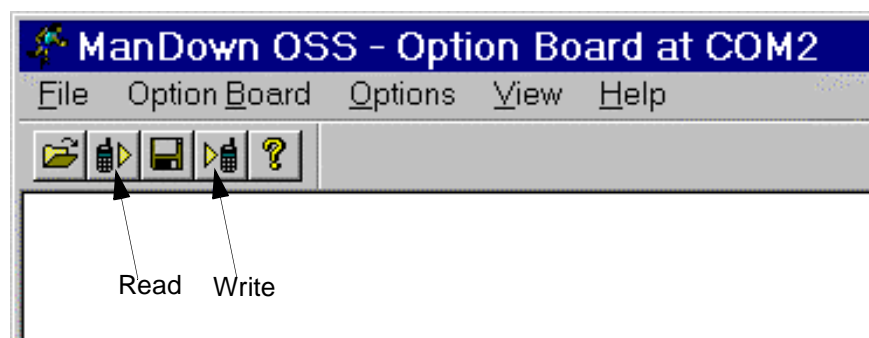


Figure 2-1 Mandown OSS Read/Write Icons

3.2 Edit the Option Board

1. Click on "OptionBoard" on the menu bar.
2. Select "Edit Data" from the OptionBoard dropdown menu.

3.3 Setting the Mandown Status

1. For basic “mandown” operation, click on “Man Down Alarm”.
2. Select the desired “Pre-Alarm Time (s)”, “Alarm Time (s)” and “Activation Angle” (which is measured in degrees from a horizontal position for the radio).
3. Select the desired “Sensor Sensitivity”.
4. If the alert is to be repeated (which is recommended), click on “Alert Repeat Enable” and select the desired “Alert Repeat Time (s)”. Your screen should appear similar to Figure 2.2

The screenshot shows the 'Edit Option Board Data' dialog box with the following settings:

- ☒ Man Down Alarm
 - Pre Alert Time (s): 100
 - Alert Time (s): 10
 - Activation Angle: 45°
- ☐ Anti-Movement Alarm
 - Pre Alert Time (s): 100
 - Alert Time (s): 10
- Sensor Sensitivity: medium
- ☐ Movement Alarm
 - Pre Alert Time (s): 10
 - Alert Time (s): 10
 - ☒ Alert Enable
- ☒ Alert Repeat Enable
 - Alert Repeat Time (s): 2
- ☐ Clock Shift

Buttons: OK, Cancel, Help

Figure 2-2 Edit Data, Mandown Alarm

3.4 Setting the Anti-Movement Status

1. To enable the “anti-movement” function, click on “Anti-Movement Alarm”.
2. Select the desired “PreAlert Time (s)” and “Alert Time (s)”. Your screen should appear similar to Figure 2.3.
3. Select the desired “Sensor Sensitivity”.
4. If the alert is to be repeated (which is recommended), click on “Alert Repeat Enable” and select the desired “Alert Repeat Time (s)”. Your screen should appear similar to Figure 2.3.

The screenshot shows the 'Edit Option Board Data' dialog box with the following settings:

- ☐ Man Down Alarm
 - Pre Alert Time (s): 100
 - Alert Time (s): 10
 - Activation Angle: 45°
- ☒ Anti-Movement Alarm
 - Pre Alert Time (s): 100
 - Alert Time (s): 10
- Sensor Sensitivity: medium
- ☐ Movement Alarm
 - Pre Alert Time (s): 10
 - Alert Time (s): 10
 - ☒ Alert Enable
- ☒ Alert Repeat Enable
 - Alert Repeat Time (s): 2
- ☐ Clock Shift

Buttons: OK, Cancel, Help

Figure 2-3 Edit Data, Anti-movement Alarm

3.5 Setting the Movement Status

Note: The “Movement” function is available only when both “Man Down Alarm” and “Anti-Movement Alarm” functions are disabled.

1. To enable the “movement” function, if necessary, uncheck “Man Down Alarm” and “Anti-Movement Alarm”. Then, click on “Movement Alarm”.
2. Select the desired “PreAlert Time (s)” and “Alert Time (s)”.
3. Select “Alert Enable” if you want an alert tone before the Emergency call will be triggered.
4. Select the desired “Sensor Sensitivity”.
5. If the alert tone is to be repeated, click on “Alert Repeat Enable” and select the desired “Alert Repeat Time (s)”. Your screen should appear similar to Figure 2.4.

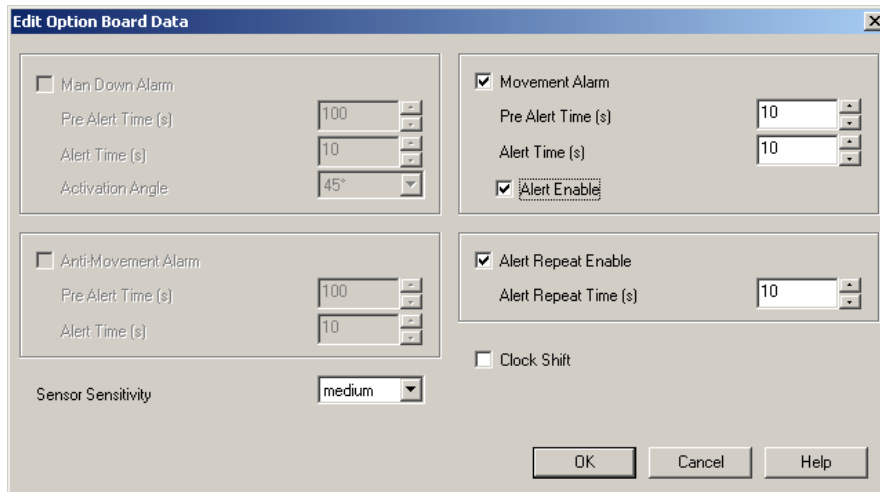


Figure 2-4 Edit Data, Movement Alarm

3.6 Programming the Option Board

Program the option board by clicking on the “Write” icon (refer to Figure 2.1) or clicking on “Write Option Board” from the “File” dropdown menu .

Note: Clock Shift functionality is not supported at this time.

4.0 Installation of the Option Board into a Portable Radio

Please refer to the Professional Radio Product Manuals, Section Basic Service Manual, Chapter 3.8 for a detailed description how to install an Option board into a radio.

APPLICATION NOTES AND SPECIFICATIONS

1.0 Introduction

This chapter provides notes on usage for different radio signalling packages, details self quieting frequencies and environmental specifications.

IMPORTANT SECURITY NOTES:

Safety: Particularly for personnel working alone or in a hazardous area or situation, we advise that this product should not be considered as the **only** method for ensuring safety.

Vibration: Subjecting the radio with ManDown active to extreme levels of vibration will cause the radio to send the alarm sequence.

Should this happen, cancel the alarm during the warning sequence and separate the radio from the source of the vibration.

1.1 5-Tone Radios

Radio Firmware: Mandown Option Board is fully supported by radio firmware from version R03.01.17. An older firmware version requires upgrading of the radio to the latest software. Dealers can download the latest Upgrade-Software from the Extranet "Motorola Online".

In alarm situation the Mandown Board triggers the emergency mode of the radio.

Recommended CPS settings for 5Tone radios:

- ☐ Per Radio - Miscellaneous - Option board Type –Advanced
- ☐ Per Personality (x) –Miscellaneous –Option Board (Checkbox checked-Index=0)
- ☐ Per Radio –Emergency- Emergency1 - Emergency Encode Telegram (as defined for the system)
- ☐ Per Radio –Emergency- Emergency2 –Emergency Cycle Mode –Forever or Limit Number of Cycles

In addition you can define a button to switch the Mandown Board ON/OFF.

1.2 MPT Radios

Radio Firmware: Mandown Option Board is fully supported by radio firmware from version R02.00.13. An older firmware version requires upgrading of the radio to the latest software. Dealers can download the latest Upgrade-Software from the Extranet.

In alarm situation the Mandown Board triggers the top button of the radio. There is no further emergency routine available in MPT radios.

IMPORTANT: In emergency case the board initiates a clear command to cancel any existing calls before the board triggers the top button. Please inform the user about this fact and consider it when you are going to define the timer settings.

Recommended CPS settings for MPT radios:

- ☐ Edit - Common - Per Radio Parameters - Option Board Fitted Mode - Advanced
- ☐ Edit - Common - Programmable buttons - TB - Dedicated call 1...6
- ☐ Edit - MPT-Personality - Options - Option board enable (Checkbox checked-Index=0)
- ☐ Edit - MPT-Personality - Dedicated Call Key: define dedicated calls, define call number 1...6 (the one defined for emergency) with the number you want to call, set key delay to the debounce time smaller than 1 second.

In addition you can define a button to switch the Mandown Board ON/OFF.

1.3 MDC/Conventional Radios

Radio Firmware: Mandown Option Board is fully supported by radio firmware from version R02.00. An older firmware version requires upgrading of the radio to the latest software.

In alarm situations the Mandown Board triggers the emergency mode of the radio. Emergency cycles have to be enabled.

Please refer to your MDC/Conv Product Manual and CPS help text for more information.

2.0 Self-Quieting Frequency List

There is a Microprocessor and a Clock Oscillator on the Mandown Board. Self interference may appear when the radio's receive frequency is within the following listed frequency ranges:

Table 3-1 Self-Quieting Frequencies

Band	Frequency Range	From:	To:
Lowband	27.9 - 50MHz	23.819MHz	23.874MHz
		31.767MHz	31.824MHz
		39.715MHz	39.773MHz
		47.663MHz	47.723MHz
VHF	136 - 174MHz	143.038MHz	143.118MHz
		150.986MHz	151.068MHz
		158.934MHz	159.018MHz
		166.882MHz	166.967MHz
		174.830MHz	174.917MHz
VHF High	300 - 350MHz	301.998MHz	302.111MHz
		309.946MHz	310.061MHz
		317.894MHz	318.010MHz
		325.842MHz	325.960MHz
		333.790MHz	333.910MHz
		341.738MHz	341.859MHz
		349.685MHz	349.809MHz
UHF1	403 - 470	405.321MHz	405.456MHz
		413.269MHz	413.406MHz
		421.217MHz	421.356MHz
		429.165MHz	429.305MHz
		437.113MHz	437.255MHz
		445.061MHz	445.205MHz
		453.009MHz	453.154MHz
		460.957MHz	461.104MHz
		468.905MHz	469.053MHz

Table 3-1 Self-Quieting Frequencies

Band	Frequency Range	From:	To:
UHF2	450 - 527MHz	453.009MHz	453.154MHz
		460.957MHz	461.104MHz
		468.905MHz	469.053MHz
		476.853MHz	477.003MHz
		484.801MHz	484.953MHz
		492.749MHz	492.902MHz
		500.697MHz	500.852MHz
		508.645MHz	508.802MHz
		516.593MHz	516.751MHz
		524.541MHz	524.701MHz

3.0 Environmental Specification

Operational Temperature Range -30 to +60°C

Storage Temperature Range -40 to +70°C

Humidity 90% RH Non-Condensing

Vibration Board may send an alarm if g exceeds ± 1.7 , shall stop within 15s of vibration stopping

4.0 Tolerances

All timings are $\pm 5\%$.

Angles $\pm 5^\circ$ at 25°C.

Angles +5 -10° at -30°C.

Angles -5 +12° at +60°C.